

11/28/16

"Remember no one can make you feel inferior without your consent." -Eleanor Roosevelt

HW: "Quadratic Inequalities" Practice #1-4

Test 1 on Thursday 12/1

AIM: How do we solve Quadratic Inequalities?

Warm-up:

$$\textcircled{*} \frac{1}{2} = 2^{-1}$$

Solve for x: $4^{2x-3} = \left(\frac{1}{2}\right)^{3x}$

$$(2)^{\textcircled{2x-3}} = (2)^{\textcircled{-1} \cdot 3x}$$

$$\begin{array}{r}
 4x - 6 = -3x \\
 \quad +6 \quad \quad +6 \\
 \hline
 4x = -3x + 6 \\
 +3x \quad +3x \\
 \hline
 7x = 6 \\
 \frac{7x}{7} = \frac{6}{7}
 \end{array}$$

$$\frac{06}{07} = \frac{6}{7}$$

$$\textcircled{x = \frac{6}{7}}$$

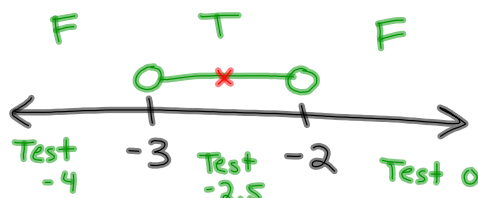
Write the solution set of each inequality in set builder, and interval notation.

1) $x^2 + 5x + 6 < 0$ negative (open) ⊗ Get everything to one side (Keep x^2 positive)

$$(x+2)(x+3) = 0$$

$$x = -2 \quad | \quad x = -3$$

↑ {CRITICAL VALUES}



$$(x+2) \quad - \quad - \quad +$$

$$(x+3) \quad - \quad + \quad +$$

$$(x+2)(x+3) \quad + \quad - \quad +$$

Set Builder: $\{x \mid -3 < x < -2\}$

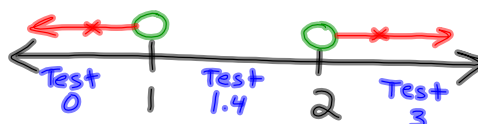
Interval: $(-3, -2)$

⊗ For interval notation
(Not included) [Included]

2) $x^2 - 3x + 2 > 0$ positive (open)

$$(x-2)(x-1) = 0$$

$$x = 2 \quad | \quad x = 1$$



$$(x-1) \quad - \quad + \quad +$$

$$(x-2) \quad - \quad - \quad +$$

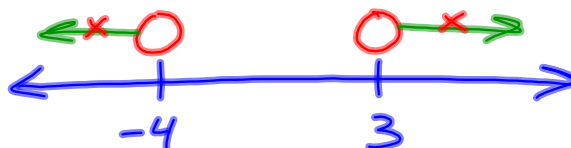
$$(x-1)(x-2) \quad + \quad - \quad +$$

SB: $\{x \mid x < 1 \text{ or } x > 2\}$

Int: $(-\infty, 1) \cup (2, \infty)$

3) $x^2 > 12 - x$
 $\frac{-12+x}{-12+x}$
 $x^2 + x - 12 > 0$
 $(x+4)(x-3)$
 $x = -4 \mid x = 3$

GO LI
 Positive
 (open)

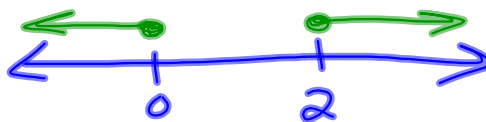


SB: $\{x \mid x < -4 \text{ or } x > 3\}$

Int: $(-\infty, -4) \cup (3, \infty)$

4) $x^2 \geq 2x$
 $x^2 - 2x \geq 0$
 $x(x-2) = 0$
 $x = 0 \mid x = 2$

GO LI
 (closed circles)



SB: $\{x \mid x \leq 0 \text{ or } x \geq 2\}$

Int: $(-\infty, 0] \cup [2, \infty)$

⊗ If x^2 is positive:

Greater than zero

Outside

Less than zero

Inside

Let's list the steps necessary to solve a quadratic inequality:

- ① Move everything to one side
(keep the " x^2 " positive)
- ② Factor/Solve for the critical values
(open circles or closed)
- ③ Do we want Positives or Negatives?
- ④ Set up the sign chart
- ⑤ Shade where we want from step 3.
- ⑥ Write the solution in the specified notation.